JOURNAL
OF THE
WASHINGTON ACADEMY OF SCIENCES

VOL. 12 DECEMBER 19, 1922 No. 21

GENERAL SCIENCE.—*A first revised edition of the Academy's list of one hundred popular books in science.*[1] ROBERT B. SOSMAN, Chairman of the Committee on Popular Books in Science.

In the latter part of 1920 Dr. George F. Bowerman, Librarian of the Public Library of the District of Columbia, suggested to the Board of Managers of the ACADEMY the desirability of having an authorized list of popular and at the same time reliable books in science which he could recommend to his readers. The Board thought well of the suggestion and appointed the President and resident Vice-Presidents, representing the fourteen affiliated societies, as a committee to prepare such a list. The writer, at that time Secretary of the ACADEMY and one of the editors of its *Journal*, was appointed editor of the list.

Part of the work was assigned to the members of the Committee, and the assistance of a number of other resident and non-resident members of the ACADEMY was also requested. The material thus compiled was prepared in the form of a preliminary report and distributed in July, 1921 for criticism. Between fifty and sixty persons cooperated, through correspondence or by personal interview, in revising this preliminary list.

The list, which then numbered somewhat over one hundred, was reduced to an even hundred by elimination of the titles which were most in doubt, and the books were grouped with accompanying notes so as to make of the whole a continuous-reading unit. This was published in the *Journal*,[2] and the books themselves were placed on view at a meeting of the ACADEMY at the Public Library on October 20, 1921, at which additional criticisms and suggestions were received.

Offprints of this preliminary publication were distributed to many libraries by Dr. Bowerman, and some useful comments and suggestions were received. It was also reprinted in the Public Library's

[1] Received November 23, 1922.

[2] This JOURNAL 11: 353–366. September 19, 1921.

bulletin and has subsequently been copied elsewhere. The widespread interest indicated in such a list led Dr. Bowerman to suggest that it be published by the American Library Association in a form available for libraries in general, and the preliminary edition above referred to has therefore been revised with that end in view.

REVISION OF THE LIST

A new committee, consisting of the President and resident Vice-Presidents for the current year, with the writer as chairman, was appointed. As a preliminary to this revision the list, condensed to author and title only, was sent to all members of the ACADEMY in the form of a ballot in December, 1921. The ballot also contained, in addition to the one hundred, forty-five titles which had been favorably recommended to the Committee. The request heading the ballot was as follows:

"The committee in charge of the selection wishes to obtain the best possible list, and will welcome your opinion on the books already selected, and your suggestions as to changes which would improve the list.

Specifications: (1) The book must be *readable;* if the average visitor to the library takes the book home, it will interest him so much that he will read it through, and will come back to ask the librarian for another on the same subject. (2) It must be *accurate;* preferably written by one who knows his subject at first hand. Minor points are: (3) up-to-dateness; (4) small bulk; (5) attractive binding, type, and illustrations.

The relative number of books in different branches of science is not fixed. For example, a good book in mathematics may be substituted for a poor book in anthropology, provided anthropology is not thereby left wholly unrepresented."

About one-fourth of the resident members responded with criticisms and new titles, and replies were also received from many non-resident members.[3] These ballots were made the basis of the new revision. The total number of books nominated and considered was 323.

A new feature of the revision which the first committee had not had to consider was the question whether books were in print. The larger libraries, when issuing reading lists, sometimes find it necessary to have many copies of a book on hand. Furthermore, copies are continually being worn out and replaced, so that for wide circulation it is important that the list contain only books which are readily

[3] It may be of interest in passing to note that the member of the ACADEMY who made the "highest score" as to the number of books read was the president of a large research institution, working in many fields of science. He had read, and gave opinions upon, fifty-two books out of the hundred. The member who came next in order was a man who had devoted most of his life to research in a relatively narrow specialty.

available. This problem has caused the removal of about twenty-five books from the preliminary list, and has required several minor revisions as further information was obtained regarding the possibility of reprinting or otherwise securing a supply of certain books. The Committee is indebted to Dr. Bowerman and the Library staff, as well as to the American Library Association, for handling the considerable volume of correspondence necessary in obtaining up-to-date information on availability, editions, paging, and prices.

THE IDEAL POPULAR SCIENCE LIST

The Committee recognizes that in giving opinions on the *readability* of scientific books it is going outside its proper province. Its true function should be to pass judgment on the *reliability* of the books. Their readability can be determined only by the reader, and the ultimate choice of such a list lies with him. The logical procedure would seem to be to take several hundred scientific books which are known to be popular simply because they are good reading, and select from among them the one hundred which are the most reliable scientifically. Unfortunately, the data for such a preliminary listing do not seem to exist. Perhaps the data are practically unobtainable, because of the large and unknown influence of the many ways, intentional or accidental, by which books are advertised. But this whole question of how books become popular is a problem outside the province of the Committee.

The Committee has done its best to select one hundred books which it feels fairly sure are scientifically reliable, and which it believes to be readable. The list is subject to revision, and indeed should be revised frequently to keep up with the progress of science and the publication of books better adapted to the purpose. The Committee will welcome opinions and suggestions looking toward a revision after a year or two of trial of the present list.

In general, it need hardly be said that even a tried and tested list can never be completely satisfactory, for the simple reason that there is no such person as the "average reader." Every individual has his own foundation of natural capacity and education, and his own background of experience and interests. We therefore need one series of lists covering all types of capacity, another series differentiated according to kind and duration of education, another series distributed according to age and to variety of experience, and still another adapted to the varied types of man's interests. Provided with such a set of

lists we could name twenty-five scientific books which would be almost certain to interest keenly any given individual. Lacking such provision, we can only hope, on behalf of the very general list herewith submitted, that every reader who can be induced to read anything at all serious will find on the list a few books which appeal to him strongly, and that none of the other books will give him the impression that science makes reading-matter which is difficult or forbidding.

BOOKS DROPPED FROM THE PRELIMINARY EDITION

The following books, which were in the preliminary list published in September, 1921, have been dropped for reasons briefly indicated:

ABBOTT, C. C. *Upland and meadow.* Out of print.

ABNEY, W. DE W. *Colour measurement and mixture.* Out of print. Not well adapted for popular reading.

Adolfo Stahl lectures in astronomy. Out of print.

AMES, J. S. *The constitution of matter.* Out of print.

BALL, R. S. *Time and tide.* Out of print.

BENNETT, L. F. *Rocks and minerals.* A manual, not a book adapted for reading.

BUCKLEY, A. B. *Life and her children.* Out of print.

COLE, G. A. J. *The changeful Earth.* Out of print.

CORNISH, V. *Waves of the sea and other water waves.* Out of print.

DARWIN, C. *The formation of vegetable mould through the action of worms.* Out of print.

DICKSON, H. N. *Climate and weather.* Out of print.

DWERRYHOUSE, A. R. *Geology.* Out of print.

GRATACAP, L. P. *A popular guide to minerals.* A manual, not adapted for reading.

HADDON, A. C. *The study of Man.* Out of print.

HALE, G. E. *The study of stellar evolution.* Out of print and replaced by a later book by the same author.

HARRINGTON, M. W. *About the weather.* Out of print.

HEADLEY, F. W. *Problems of evolution.* Out of print.

HERRICK, F. H. *Home life of wild birds.* Out of print.

KIDD, D. *Savage childhood. A study of Kafir children.* Out of print.

LOTSY, J. P. *Evolution by means of hybridization.* Considered by some to be too specialized for popular reading. Also difficult of importation, being a Continental book.

LUBBOCK, J. *Flowers, fruits and leaves.* Out of print.

MICHELSON, A. A. *Light waves and their uses.* Out of print.

PECKHAM, S. W., and PECKHAM, E. G. *Wasps, social and solitary.* Out of print.

PERRY, J. *Spinning tops.* Out of print.

SEELY, H. G. *The study of the Earth in past ages.* Written for British rather than American readers.

TALMAN, C. F. *Realm of the air.* (Title subsequently changed to *Meteorology, the science of the atmosphere.*) Part of a series which the publishers would not promise would be available singly.

THORPE, E. *History of chemistry.* A two-volume work. Also thought by some to be not well adapted for popular reading.

TYNDALL, J. *Fragments of science.* Now obtainable only as two volumes; some of the essays now out of date and incorrect in certain particulars.

WHETHAM, W. C. D. *The recent development of physical science.* Out of print.

The following titles were put on the revised edition for 1922, but had to be removed subsequently because they were found to be out of print:

HEADLEY, F. W. *Life and evolution.*

LE CONTE, J. *Sight: An exposition of the principles of monocular and binocular vision.*

SHALER, N. S. *Aspects of the Earth.*

STERNBERG, C. H. *The life of a fossil hunter.*

It may be that some of the books contained in the two lists above are much better adapted for popular reading than some of the books on the revised list. The Committee would be grateful to any reader of this report for having its attention called to such books, because if they are badly needed there is a possibility of having them reprinted, either by the original publisher or through agreement with some other publisher who may be willing to assume the risk for the sake of aiding in making available first-class popular science.

As the complete "first revised edition" of 1922 will soon be obtainable through the American Library Association and will probably be distributed by several large libraries, it hardly seems worth while to reprint here the full list with accompanying notes and connecting paragraphs. For convenience of reference, however, the authors and titles of this latest edition are reprinted below:

General science:

1. THOMSON, J. ARTHUR, Editor. *The outline of science.*
2. HUXLEY, THOMAS HENRY. *Selections from Huxley.*

Man:

3. THORNDIKE, EDWARD L. *The Human Nature Club.*
4. JAMES, WILLIAM. *Psychology.*
5. WOODWORTH, ROBERT S. *Psychology; a study of mental life.*

6. OSBORN, HENRY FAIRFIELD. *Men of the Old Stone Age; their environment, life and art.*
7. MASON, O. T. *The origins of invention.*
8. MASON, O. T. *Woman's share in primitive culture.*
9. HOUGH, WALTER. *The Hopi Indians.*
10. MCCOLLUM, E. V. *The newer knowledge of nutrition.*
11. SHERMAN, H. C. *Food products.*
12. EDDY, WALTER H. *The vitamine manual; a presentation of essential data about the new food factors.*
13. JORDAN, E. O. *Food poisoning.*
14. KEEN, WILLIAM WILLIAMS. *Medical research and human welfare.*
15. HUNTINGTON, ELLSWORTH. *Civilization and climate.*

Heredity:

16. DARWIN, CHARLES. *The origin of species.*
17. EAST, E. M., and JONES, D. F. *Inbreeding and outbreeding.*
18. CASTLE, W. D., COULTER, J. M., DAVENPORT, C. B., EAST, E. M., and TOWER, W. L. *Heredity and eugenics.*
19. MORGAN, T. H. *A critique of the theory of evolution.*
20. CONKLIN, E. G. *Heredity and environment.*
21. GALTON, FRANCIS. *Hereditary genius.*
22. POPENOE, PAUL, and JOHNSON, R. H. *Applied eugenics.*

Biology:

23. THOMSON, J. ARTHUR. *The wonder of life.*
24. THOMSON, J. ARTHUR. *The haunts of life.*
25. BOUVIER, E. L. *The psychic life of insects.*
26. CURTIS, WINTERTON C. *Science and human affairs.*
27. LOCY, WILLIAM A. *Biology and its makers.*

Zoology:

28. BUCKLEY, A. B. *The winners in life's race.*
29. NELSON, E. W. *Wild animals of North America.*
30. ROOSEVELT, THEODORE. *African game trails.*
31. BEEBE, C. W. *Jungle peace.*
32. STONE, WITMER, and CRAM, W. E. *American animals; a popular guide to the mammals of North America north of Mexico.*
33. CHAPMAN, FRANK M. *Camps and cruises of an ornithologist.*
34. FABRE, J. H. *Social life in the insect world.*
35. MAETERLINCK, MAURICE. *The life of the bee.*
36. JENKINS, OLIVER P. *Interesting neighbors.*
37. BLATCHLEY, W. S. *Gleanings from Nature.*
38. MAYER, ALFRED G. *Sea-shore life.*

Botany:

39. GANONG, W. F. *The living plant; a description and interpretation of its functions and structure.*

40. OSTERHOUT, W. J. V. *Experiments with plants.*
41. SORAUER, PAUL. *A popular treatise on the physiology of plants for the use of gardeners or for students of horticulture and agriculture.*
42. HARDY, MARCEL E. *The geography of plants.*
43. DARWIN, CHARLES. *Insectivorous plants.*
44. TOWNSEND, C. W. *Sand dunes and salt marshes.*

Microscopic life:

45. VALERY-RADOT, RENÉ. *Louis Pasteur, his life and labours.*

Paleontology:

46. LUCAS, F. A. *Animals of the past.*
47. HUTCHINSON, H. N. *Extinct monsters and creatures of other days; a popular account of some of the larger forms of ancient animal life.*

Geology and geography:

48. GREGORY, J. W. *Geology of to-day.*
49. HAWKESWORTH, HALLAM. *The strange adventures of a pebble.*
50. LULL, R. S., and others. *The evolution of the Earth and its inhabitants.*
51. CHAMBERLIN, T. C. *Origin of the Earth.*
52. GEIKIE, ARCHIBALD. *The founders of geology.*
52A.[4] MERRILL, GEORGE P. *The first one hundred years of American geology.*
53. SEMPLE, ELLEN CHURCHILL. *Influences of geographic environment.*
54. SPURR, J. E., Editor. *Political and commercial geology and the world's mineral resources.*
55. BRIGHAM, ALBERT P. *Geographic influences in American history.*

Geologic agents:

56. TYNDALL, JOHN. *The forms of water in clouds and rivers, ice and glaciers.*
57. BONNEY, T. G. *The work of rains and rivers.*
58. BONNEY, T. G. *Volcanoes, their structure and significance.*
59. RUSSELL, ISRAEL C. *Volcanoes of North America.*
60. DAVISON, CHARLES. *The origin of earthquakes.*

Meteorology:

61. LEMPFERT, R. G. K. *Weather science.*
62. WARD, R. DE C. *Climate, considered especially in relation to Man.*

The ocean:

63. MURRAY, JOHN. *The ocean.*

Rocks and minerals:

64. COLE, GRENVILLE A. J. *Rocks and their origins.*

Astronomy:

65. BALL, ROBERT S. *The story of the heavens.*
66. DYSON, F. W. *Astronomy.*
67. HALE, GEORGE E. *The new heavens.*
68. ABBOT, CHARLES G. *The Sun.*

[4] Now out of print, but will be reprinted in 1923, when it will replace no. 52.

69. LEWIS, ISABEL M. *Splendors of the sky.*
70. MCKREADY, KELVIN. *A beginner's star book.*
71. TURNER, H. H. *A voyage through space.*
72. BERRY, ARTHUR. *A short history of astronomy.*

Chemistry:

73. SLOSSON, E. E. *Creative chemistry.*
74. HENDRICK, ELLWOOD. *Everyman's chemistry.*
75. FULLER, HENRY C. *The story of drugs.*
76. FABRE, JEAN HENRI. *The wonder book of chemistry.*
77. DUNCAN, ROBERT KENNEDY. *The chemistry of commerce.*
78. MARTIN, GEOFFREY. *Modern chemistry and its wonders.*
79. SODDY, FREDERICK. *The interpretation of radium.*
80. VENABLE, F. P. *A short history of chemistry.*
81. SMITH, EDGAR FAHS. *Chemistry in America.*

Physics:

82. SODDY, FREDERICK. *Matter and energy.*
83. MILLS, JOHN. *Within the atom.*
84. EINSTEIN, ALBERT. *Relativity.*
85. FLEMING, J. A. *Waves and ripples in water, air, and aether.*
86. MILLER, DAYTON C. *The science of musical sounds.*
87. BRAGG, WILLIAM. *The world of sound.*
88. LUCKIESH, MARION. *Color and its applications.*
89. BOYS, C. V. *Soap bubbles: their colours and the forces which mould them.*
90. MACH, ERNST. *Popular scientific lectures.*
91. SODDY, FREDERICK. *Science and life.*

Mathematics:

92. WHITEHEAD, A. N. *Introduction to mathematics.*
93. CONANT, LEVI LEONARD. *The number concept, its origin and development.*
94. YOUNG, JOHN WESLEY. *Lectures on the fundamental concepts of algebra and geometry.*
95. SHAW, JAMES BYRNIE. *Lectures on the philosophy of mathematics.*
96. DE MORGAN, AUGUSTUS. *On the study and difficulties of mathematics.*
97. SMITH, DAVID EUGENE. *Number stories of long ago.*

History of science:

98. LIBBY, WALTER. *An introduction to the history of science.*
99. SEDGWICK, W. T., and TYLER, H. W. *A short history of science.*
100. WHITE, ANDREW D. *A history of the warfare of science with theology in Christendom.*

SCIENTIFIC NOTES AND NEWS

L. B. ALDRICH of the Smithsonian Institution is taking charge of the solar observing station at Montezuma, Chile, probably until 1925.

Dr. L. M. ESTABROOK of the Bureau of Agricultural Economics, Department of Agriculture, will leave in January for the Argentine, the government of which has asked him to reorganize the economic and statistical work of the similar department in that country. During his absence his work will be in charge of W. F. Callander.

Dr. ALES HRDLICKA has returned from a trip to South America and Europe. In Europe he was enabled to visit a number of important sites, some of them new, of finds of Early Man, and to personally examine all the skeletal remains of ancient man discovered since his European visit in 1912. Among them were the remains of the Piltdown Man, and the Rhodesian skull recently discovered in South Africa.

The Petrologists' Club met on Tuesday, November 28. Dr. F. E. WRIGHT of the Geophysical Laboratory, Carnegie Institution of Washington, gave an informal illustrated talk on *A geologic trip to South Africa.*

The National Research Council has appointed the following committee to examine the project for the establishment of a tropical research station in Panama: NEVIN M. FENNEMAN (Chairman), *Chairman of the Division of Geology and Geography;* HENRY S. GRAVES, *Chairman of the Division of States Relations;* FREDERICK P. GAY, *Chairman of the Division of Medical Science:* RAYMOND DODGE, *Chairman of Anthropology and Psychology;* and VERNON L. KELLOGG, *Permanent Secretary of the Council.*

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